Remarks/Arguments:

In response to the Final Office Action, the applicants offer the following remarks. First, the applicants appreciate the opportunity given their counsel, Christopher R. Lewis and Christian M. Bauer, to discuss the subject matter of the claimed invention in a telephonic interview with Examiner Tran on May 5, 2004. During the interview, the applicants' counsel emphasized that the Hsiao reference fails to disclose step (i) (oxidizing a substantial part of HC), and moreover, lacks step (i) followed by step (ii) (catalytically treating the product of step i).

In view of the interview with the Examiner, the applicants have filed this RCE with amendments to the claims in an effort to resolve the existing issues. The applicants submit this RCE, therefore, to clarify the issues and submit that the pending claims are not anticipated or obvious in view of the Hsiao and Penetrante references. The applicants respectfully submit that the pending claims are in a condition for allowance and respectfully request early notification to that effect.

With this amendment, claims 1, 4-7, 9-11, 13-15, 16-25, 31, 32, and 37-49 are amended. Claim 3 has been cancelled. The amendments to the claims clarify the order of the limitations and identify the structure of the process. No new matter has been added. Claims 1, 4-7, and 9-49 are pending.

The present invention is directed to a process and system for the treatment of exhaust gases from an internal combustion engine. The process first catalytically oxidizes HC either contained in the exhaust gas or introduced by another means. Then, the process utilizes the oxidized hydrocarbons to catalytically convert NO in the exhaust gas to NO_2. The system also traps particulate matter or soot to be burned. In this manner, the NO_2 produced facilitates combustion of the trapped soot. For convenience, newly amended claim 1 is recited below.

1. (Currently Amended) A process of treating internal combustion engine exhaust gas containing O_2, NOx, unburnt hydrocarbon ("HC"), CO and soot, comprising the steps of:

i. contacting the engine exhaust gas with a first catalyst adapted to be fed with the engine exhaust gas and effective to promote oxidation of HC to oxidize a substantial part of the HC;

ii. contacting the engine exhaust gas that passed over the first catalyst with a second catalyst effective to promote the catalytic oxidation of NO to NO_2 catalytically treating the engine exhaust gas to oxidize NO to NO_2;

iii. collecting soot on a filter adapted to be fed with the engine exhaust gas that has passed over the first and second catalysts; and

iv. combusting the collected soot by reaction with the catalytically oxidized NO_2 and the O_2.

As emphasized in the applicants' previous two responses, the Hsiao reference is directed to pre-converted nitric oxide gas in a catalytic reduction system. Hsiao teaches a two stage process. The first stage is the oxidation of NO to NO_2 in the presence of O_2 over a plasma arc. HC's are injected upstream of the first stage (shown in FIG. 3) and enhance the oxidation of NO to NO_2. (col. 9, lines 38-40). The second stage is the catalytic reduction of the HC's, namely, the catalytic breakdown of the original hydrocarbon molecules into smaller molecules and radicals. (col. 9, lines 45-49). Hsiao therefore teaches that the hydrocarbons are used to enhance the NO oxidation process in the plasma, and the hydrocarbons are required for the chemical reduction of NO_2 on the catalyst surface.

The applicants submit that newly amended claim 1 is limited to a specific order. The applicants have removed the term "product" and have clearly identified that step ii is completed after "the engine exhaust gas . . . passe[s] over the first catalyst," and soot is collected from exhaust gas "fed with the engine exhaust gas that has passed over the first and second catalysts." The applicants submit that claim 1 is therefore limited to a specific order, namely, step i, then step ii, followed by step iii.

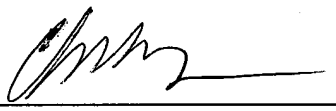
The applicants have also amended claims 1 and 16 to include the structure inherent in the method and apparatus. For example, claim 1 clarifies that oxidation of the HC's occurs over a first catalyst and oxidation of NO to NO_2 occurs over a second catalyst.

Regarding the Hsiao reference, in view of the above discussion and claim amendments, the applicants submit that Hsiao neither teaches nor renders obvious the claimed invention. Moreover, the applicants submit that Hsiao teaches away from the presently claimed invention. Claim 1 is limited to a specific order of steps as identified above. In contrast, Hsiao teaches that the first step in the two-stage process is the oxidation of NO to NO_2 and also teaches the addition of HC's. In further contrast, Hsiao teaches that the addition of HC's enhance the NO to NO_2 oxidation. Moreover, if, as suggested by the Examiner, the injected HC's of Hsiao are inherently oxidized as they enter the exhaust system (a point the applicants address below), then there would be no HC's to enhance the NO to NO_2 oxidation. Hsaio would not work for its intended purpose.

Finally, the applicants address the Examiner's statement during the interview that with the injection of HC's into diesel engines, the HC's will be inherently oxidized showing applicants' step (i) even in the absence of a catalyst. The applicants disagree. If the present rejection is to be maintained, the applicants respectfully request that the Examiner provide a reference to support this proposition.

The applicants submit that Hsiao fails to teach or suggest the recited steps as recited in the amended claims. Secondly, the applicants additionally submit that the claims contain sufficient structure as to properly define the inventive subject matter of the applicants. In view of the Examiner interview, the amendments to the claims, and the above arguments, the applicants respectfully submit that the pending claims are in a condition of allowance.

Respectfully submitted,



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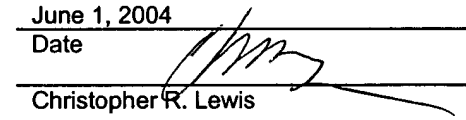

Christopher R. Lewis

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